Journal of Scientific Exploration
Anomalistics and Frontier Science

ESSAY

Failings of Nessie Debunkers and of Debunkers in General

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SUBMITTED February 3, 2023
ACCEPTED July 17, 2023
PUBLISHED March 31, 2024

https://doi.org/10.31275/20242877

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HIGHLIGHTS

Debunkers of "Nessie" often rely on logical fallacies that only address the weakest evidence versus the strongest evidence that requires more careful study.

ABSTRACT

That Loch Ness Monsters, "Nessies", might exist has been argued by many people on the basis of films, sonar contacts, photos, and eyewitness accounts. At the same time, some observers have insisted that these are not real creatures, nothing but misperceptions of natural phenomena or known animals. Their arguments typically address the weakest evidence (eyewitness accounts) rather than the strongest objective evidence of sonar and film. Such evasion or avoidance constitutes a strategy of misdirection, as does the insistence that, since Nessies are not recognized by "science," therefore taking their possible existence seriously amounts to doing pseudo-science. Debunkers arguably irrational and go beyond the evidence in declaring that Nessies are definitely non-existent. Although Nessie fans do believe that they exist, most will admit that final proof requires a specimen or detailed close-up of unequivocally valid photography and insist only that enough evidence exists to warrant further searches: that is not pseudo-science.

KEYWORDS

Cryptozoology, field research, Loch Ness Monsters, Nessies, strategies of debunking.

INTRODUCTION

There is considerable, widespread public interest in many topics that are pooh-poohed and dismissed by the established institutions of academic science and medicine. The number of such topics is vast, but many of the best-known ones are subsumed in the three major groupings of *parapsychology* (study of psychic phenomena), *ufology* (study of unidentified aerial phenomena, UFOs), and *cryptozoology* (possible existence of animals officially regarded as extinct or mythical or not known in the claimed particular place or time).

Among these interests officially regarded as intellectually beyond the pale, there may well be no topic more widely recognized around the world than the Loch Ness Monster, or 'Nessie'. All media and advertisers seem to know that they can attract attention by mentioning Nessie. Newspapers frequently recycle stories about the Loch Ness Monster. Television documentaries about it continue to be made, as well as fictional movies. Starting in late July 2022, dozens of newspapers and online media used such ledes as "Scientists say Loch Ness Monster

plausible"[3] merely because of the discovery in *Morocco* of the fossil of a *small* plesiosaur in a freshwater environment (Bunker et al., 2022). One observer has been moved to beg the media to stop using Nessie as clickbait[4].

Opinions are divided over the possible reality of as-yet-unidentified large creatures in Loch Ness, ranging from asserted positive certainty through a degree of neutrality to indignantly expressed certainty that Nessies are anything but real animals. A popular view among those of the last opinion is that Nessies are a creation of the Scottish tourist industry. Among those who believe Nessies to be real, there is no agreement as to what sort of animal they might be, although reptilian seems more favored than fish, mammal, amphibian, or invertebrate, all of which have been suggested at one time or another.

Since debunking has its origin in a determined presumption that some given unorthodox claim is unbelievably unlikely to be valid, the debunkers' polemics then focus on demonstrating this improbability. Typically rehearsed are the imperfections of human perception and recall, including the psychological bias that causes us to "see" what we expect to and the unhappy fact that some people may, for various reasons, behave dishonestly, to the extent of perpetrating hoaxes; and, with Nessies, much is made of the innumerable things and happenings around Loch Ness that could easily be mistaken for a sighting of a Monster[5] .

Debunkers then naturally conclude that all the possibilities they have suggested are more probable than the highly improbable existence of Nessies. High improbability is then equated with certainty[6]: case closed! But the case for Nessies is not that their existence is probable; it is that they exist *even though this naturally seems highly improbable*. All the reasons for the improbability are simply irrelevant.

DISCLOSURES

We authors have long been of the opinion that Nessies are real animals, and fascinated by the mystery of what type of species they may be. Accordingly, we disclose conflicts of interest as we debunk the arguments of the Nessie debunkers:

Henry Bauer: Around 1961 or 1962, I happened to come across Tim Dinsdale's *Loch Ness Monster*. Intrigued by the published clips from his film, I read whatever else I could find on the subject. I became a member of the Loch Ness Investigation, receiving their Newsletters while living in Australia. During a sabbatical year at the University of Southampton, I visited Loch Ness and there met Dinsdale, who subsequently became a close friend. I organized lecture tours for him in 1975 in Kentucky (USA) and in 1979 in Virginia (USA). Tim gave me a 16 mm. copy of his film, which I had digitized frame by frame in the early 1980s by a commercial company, and again a few years later courtesy of a professor of computer science at my university (Virginia Tech).

I visited Loch Ness again in 1983; spent a couple of months there in 1985, and for nearly 20 years, from 1987, my wife and I spent two to three weeks every summer at or near Loch Ness, usually in a chalet or cottage overlooking Urquhart Bay. At various times I met and talked with a number of individuals who have featured in the Loch Ness saga: Alastair Boyd, Winifred (Freddie) Cary, Gary Campbell, Steuart Campbell, Tony Harmsworth, Steve Feltham, Rip Hepple, Dick Raynor, Robert Rines, Adrian Shine, and Nick Witchell.

I became thoroughly familiar with common phenomena easily misperceived as Nessies[5]: wind and wave effects; wakes made by duck families; I saw the head of a seal in the Bay in 1985 and filmed in 1983 a wake remainder that looked just like something dark breaking the surface several times, causing white splashes.

We became friends with Dick and Sybil Mackintosh and heard from Dick, a lifelong fisherman on Loch Ness, of his encounter with "a huge gray mass" that once broke the surface not far from his boat. The proprietor of the places we rented related that his mother had once seen Nessie in the Bay.

By courtesy of the Lowrance sonar company, I was an observer at Operation Deepscan in 1987. I participated in the Loch Ness symposium at the Museum of Natural History in Edinburgh, also in 1987, and at the meeting in Drumnadrochit in 1999.

I now believe that the Dinsdale film establishes decisively that Nessies are real, though my book on the matter (Bauer, 1986) did not aim to make that case but rather seeks to clarify the controversy. My most recent guess is that Nessies are relatives of something akin to turtles (Bauer, 2020), whose ancestry is close to that of plesiosaurs.

Roland Watson: My interest in the Loch Ness Monster began as a school kid back in the 1970s when I can recall the excitement over the 1975 Rines underwater photographs. My first visit to the loch was back in 1982 as a student undertaking camera watches, traveling to each point by bicycle.

My interest abated as I pursued a career in England, but the belief in a monster, whatever it was, did not disappear. A return to Scotland in the 1990s rekindled interest as the Internet brought interested parties together. The annual trips resumed in the 2010s as I began blogging on the subject and authored three books (Watson, 2011, 2018, 2019). I now visit the loch several times a year, en-

gaged in the hunt.

Though proving monsters is not the aim here, the cases I cover are ones that I believe to be genuine sightings of the famous monster. Indeed, as far as classic photographs are concerned, I find it statistically improbable that no such clear photographs of the creature(s) would have been taken over the classic period of 1933-1975, let alone the last 90 years.

EVIDENCE OF UNIDENTIFIED ANIMALS IN LOCH NESS

This essay is a critique of dogmatic assertions that Nessies definitely do not exist, not an attempt to make a convincing case that Nessies are real. So here, we merely survey the reliability and significance of the various types and individual pieces of evidence. Whyte (1958) and Witchell (1974) can be recommended for general background and context: histories of sighting claims; chronology of searches and investigations; reports of similar creatures from other lakes in Scotland and also around the world; possibly relevant folklore, legend, myth.

On any subject, the best evidence comprises objective data that are known to be genuine and that remain available for further examination. For animals, one wants an actual specimen, be it a carcass, a skeleton, fossil, or an authentic sample of DNA. For Nessies, so far, none of these are at hand.

The Best Objective Data About Nessies are Films

The first two of the following films were taken long before they could have been faked by computer programs, which nowadays would be quite feasible:

1. *Dinsdale (1960)*. This 16 mm film is available on the Internet[7]. A detailed description with still photos is in Bauer (2002), together with mention of pertinent TV documentaries. The film was examined by experts at Kodak and at JARIC (Britain's Joint Air Reconnaissance Intelligence Centre); the latter's report judged that it showed probably an animal, given that the hump was not a boat nor a submarine.
2. *Fraser (1934)*. A search organized by Sir Edward Mountain in the 1930s obtained a film whose present whereabouts are unknown; but it had been shown at a meeting of the Linnean Society. Experts on a range of aquatic creatures could not identify it, and the experts variously commented: "Not whale-like, maybe seal?"; "Exactly like seal"; "never seen seal swim like that"; "nothing like seal, just a common otter."[8]
3. *Peter and Gwen Smith (1977)*. The Smiths filmed from the shore a large object that rose vertically out of the water briefly and then went down again; two boys in a boat saw the same thing[9].

Other films have been claimed without making them available or providing other credible support, Mackal (1976, pp. 115, 290-294) lists 22 items, including Dinsdale and Fraser.

Sonar

Sonar also delivers objective data, provided the charts or photos of screens are known to be authentic. However, interpreting sonar echoes involves assumptions, particularly about the density of the target when estimating size, and sonar delivers information about the shape of a target only if it is stationary and scanned slowly.

At Loch Ness, the sonar evidence stems from many different investigators over several decades and using many different types of equipment, reporting echoes from apparently large, moving objects. Several reports target moving up from and returning to deep water. There have also been a few reports of actual sonar tracking of moving targets. For details of these reports, see Bauer (2002) and Mackal (1976, pp. 123-132, 295-308). In 1987, during Operation Deepscan, technical experts from Lowrance Electronics interpreted three deep-water contacts that could not be later again located as bigger than sharks and not from fish shoals (Bauer, 1987).

Cruise boats and individual boaters continue to report deep-water contacts[10].

Webcams have been in place at Loch Ness for years[11] . As yet, they have not delivered any definitive data.

Environmental DNA (eDNA)

eDNA also constitutes objective data. Pioneering eDNA work at Loch Ness was carried out by Professor Gemmell's team in 2018 (Bruce, 2018). A surprising variety of species was detected, including some land-based creatures. However, some species known to be there did not leave DNA among the collected samples: otters, newt, carp, and roach[12], illustrating that sampling of the waters cannot be guaranteed complete, because it requires that target species must have been in sampled places fairly recently.

25% of the collected DNA bits remain unidentified. The deepest water was not well sampled, and sampling was done over a period of only two weeks. The possible presence of a species related to turtles (Bauer, 2020) was not excluded[13].

Figure 1. Surgeon's Photo to Loch Ness Monster (First published in *Daily Mail*, 21 & 23 April 1934).

Surface Photos

The authenticity of all the claimed photos of Nessies at the surface has been questioned, and quite a few are generally agreed to be hoaxes or misinterpretations [14]. The commonly cited photos are reproduced in many books, for instance, Dinsdale (1961-1982), Mackal (1976, pp. 93-114), Watson (2019), Whyte (1957), and Witchell (1974-89). The iconic image is the 'Surgeon's photo' (Figure 1).

Martin and Boyd (1999) obtained a deathbed confession from a claimed perpetrator that this is a fake, but the credibility of this story is itself questionable for several reasons (Shuker 1995, pp. 87–8).

Underwater Photos

Searches organized by Robert Rines obtained underwater photographs using strobe lighting and simultaneous sonar observation (Mackal, 1976, pp. 277-288). In 1972, two photos showed a flipper-like shape; in 1975, one photo could be interpreted as a head with small projections and an open mouth, and another looked like the front of a body attached to a long neck. Here too, there has been controversy over computer-enhancing and misinterpretation.

Eyewitness Accounts

Reports by eyewitnesses are the earliest claimed evidence, but of course, they are also the least objective and certainly not available for re-examination. Mackal (1976, pp. 83-92, 223-268) mentions 10,000 reported sightings and gives details of 251 that he considered authentic, categorized by frequency of observation and by time of day and season of the year. Bauer (1986, pp. 169-200) lists sighting reports and their provenance from the oft-mentioned St. Columba story (565 AD/CE) to 1985. Watson has discussed a number of notable cases[15].

THE CASE FOR NESSIES

The range of evidence just listed suggests that the simplest explanation (recommended by Occam's Razor) is that all of it stems from the same phenomenon, namely, the existence of a herd of aquatic animals whose adults can be very large, comparable in size to large sharks. Bayesian statisticians would agree that the probability that Nessies are real is significantly increased by the synergy of so many different types of evidence (Bauer, 2022).

The detailed case for Nessies or their relatives is described in a number of books: Dinsdale (1961-82), Gould (1934), Heuvelmans (1968), Mackal (1976), Oudemans (1892), Watson (2011, 2018, 2019), Whyte (1957), Witchell (1974-89). Bibliographies of pertinent published material are in Bauer (1980, 1982, 1986, pp. 201-233). Roland Watson's blog posts[16] have covered the range of evidence and controversy. Less systematic or less available material includes Newsletters of the Loch Ness Investigation (Bureau), which was active in the 1970s; Gary Campbell's *Nesspaper* and website[17]; and Rip Hepple's *Nessletters*.

The Debunkers' Cases

In the absence of a type specimen, definitive proof that Nessies are real remains obviously lacking. But why should it seem so important to anyone to assert that Nessies definitely do not exist? After all, definitive proof of that is also lacking; indeed, it is not obvious what could constitute such certifiable proof: draining the Loch?

If the disbelievers were satisfied with saying that proof requires a physical specimen and that they do not accept the available evidence as decisive, one would not quarrel with them. What is uncalled for is the insistence, which goes beyond the evidence, that Nessies definitely *do not* exist and that seeking to find and identify them is pseudo-scientific.

While believers are reassured by the cumulative significance of the range of evidence — films, sonar, eyewitnesses, photos — the doubters have to offer *separate and different* explanations for each type and bit of evidence.

The case against Nessies has been argued by two groups of people:

- *Frustrated erstwhile Nessie believers who became determined debunkers*: Binns (1983, 2017, 2019); Harmsworth (2010); Raynor[18]; Shine (2006).
- *People who campaign against pseudo-science in general and include Nessie-seeking in that category*: Camp-

Figure 2. Morar Wake (Binns 1983, fig. 14, p. 117).

bell (1986); Gordin (2021); Loxton & Prothero (2012); McIntyre (2021); Naish (2013, 2017); Prothero (2013); Radford & Nickell (2006).

The latter group insists that seeking Nessie is unscientific, but that argument amounts only to asserting that *contemporary scientific consensuses* do not recognize the existence of Nessies. That falls far short of proof of non-existence, nor does it explain what might be unscientific about searching for more evidence by people who happen to be interested. Nessie-seeking differs inevitably from professional, scientific activity (Bauer, 1986, pp. 76-79), but amateurs are quite capable of doing good science — they continue to make important discoveries in astronomy, for instance.

Both debunker groups make the same criticisms of the claimed evidence. They concentrate at length on the weaknesses of *the weakest evidence* while failing to undermine decisively the most objective data: film and sonar. Such failure is an all-too-common practice among those who decry various 'denialisms', the questioning of some mainstream scientific consensus. Sadly, would-be debunkers also frequently get important facts wrong.

The Dinsdale Film

Disbelievers have found no way to discredit this, the strongest objective evidence that unidentified animals

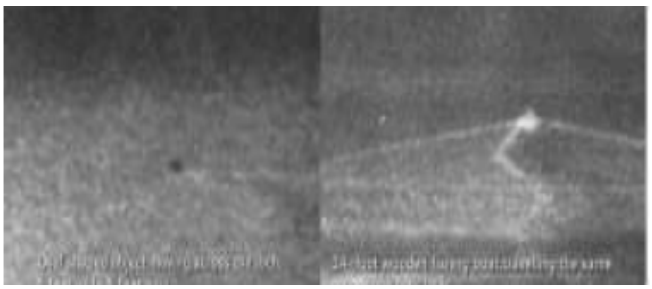

Figure 3. Hump and Control Wakes (Attribution: See Endnote 7).

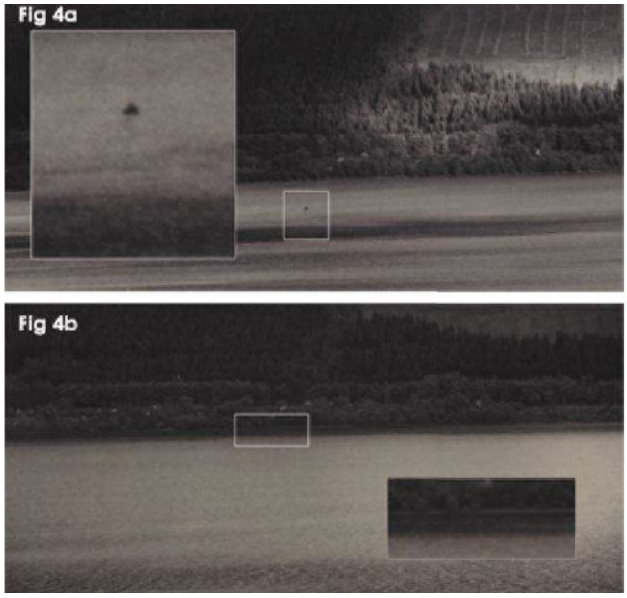

Figure 4. Shine's 4a, 4b (Attribution: See Endnote 19).

exist in Loch Ness. Their only recourse has been to assert that the filmed dark hump must be a misidentified boat. All can judge for themselves by viewing the film[7] whether that claim is sustainable, perhaps particularly when the dark hump submerges yet continues to throw up a large wake with no solid object visible above the surface.

Binns (1983, pp. 107-125) was the first to publish the assertion that the hump is a misidentified boat and has repeated the claim decades later (Binns, 2017, 2019). But his lengthy diatribes offer no substantive grounds for questioning the JARIC inference that the hump is an animal. He disputes that the wake made by the hump is significantly different from the wake of the boat that

Figure 5. Shine's 3a, 3b (Attribution: See Endnote 19).

Dinsdale filmed as a control, and to support that claim offers his Fig. 14 (preceding p. 117), reproduced here (Figure 2), which shows a boat on *Loch Morar*, *not Loch Ness*, and moving *toward* the camera, which vitiates any critical comparison of the wake with that of Dinsdale's hump, where the hump *leaves behind* no central propeller wash whereas Dinsdale's control boat does (Figure 3).

Determined efforts to film a boat on Loch Ness, that could look something like the hump in Dinsdale's film, have been made by Richard Carter, Dick Raynor, and Adrian Shine[19], all of them long familiar with Loch Ness and Nessie matters; but their filming of a boat was unable to achieve anything even suggestively like the Dinsdale hump[20].

Steuart Campbell (1986) questioned JARIC's estimate of the speed of Dinsdale's hump as reaching 10 mph and thereby excluding the possibility that it was a fishing boat. That argument rests on mere speculations: when and for how long did Dinsdale pause filming to rewind the camera's clockwork mechanism? Was his account accurate as to the height above the Loch? Campbell's discussion was reviewed rather unfavorably by naturalist Richard Fitter (1988).

At some later date, Adrian Shine disseminated to interested people "The Dinsdale Loch Ness Film. An Image Analysis"[19,20]. He cited Campbell's critique as accurate, and claimed that the Carter-Raynor-Shine exercise showed that "a dingy could account for the significant features seen in the Dinsdale film." But, Shine's Figures 4a,b (Figure 4), are so dark and unfocused as to be useless.

Shine also asserted that the last portion of the Dinsdale film, where the large wake travels right to left, shows the head of a helmsman a little behind the splashes near the wake. It needs to be appreciated that Shine's assertions are based on a poor, third-iteration copy of the film, taken from a television screen playing a documentary that included a piece of the Dinsdale film (Harmsworth, 2010, pp. 128ff). Shine's Figure 3a is supposed to reveal the helmsman's head, purportedly similar to an actual boat (his Figure 3b and Figure. 5).

We beg to differ over that alleged similarity. Furthermore, Dinsdale's original film had been scanned and computer-examined by Alan Gillespie at the Jet Propulsion Lab without any such helmsman showing up. Bauer had a 16 mm copy of the film (given him by Dinsdale) commercially digitized and found no hint of such a helmsman's head; more recently, a computer scientist at Virginia Tech had the pertinent frames scanned, and there was again no sign of the alleged head[21].

In his book, Shine (2006) reproduced his Figs. 3a,b and asserts that "members of the original 'JARIC' assessment team" now agreed that the hump "has the overall appearance of a small craft with a feature at the extreme rear; consistent with the position of a helmsman." We beg to differ again and urge readers to compare the Figures. The alleged concurrence of the JARIC member was shown in a TV documentary (Harmsworth, 2010, p. 129), with Shine standing over the seated man and demanding his assent in a bullying manner.

Later debunking accounts usually cite Binns (1983), Campbell (1986), or Shine as proof that Dinsdale's hump is a boat (Loxton & Prothero (2012, ch. 4)[22]. Naish (2017:, pp. 97ff) offers the entirely unsupported speculation that "if the boat . . . were dark-coloured and if the weather conditions . . . were more overcast, it would look about identical to the 'monster hump'". Harmsworth (2010, pp. 128ff) argued the same points as Shine and indeed participated in the first imagining of a helmsman in a TV documentary.

Radford and Nickell (2006, p. 8) acknowledge that Nessie is the global iconic lake monster, and they promote their own book on lake monsters as ground-breaking — yet over Loch Ness, they defer entirely to Binns:

> Rather than simply cataloging the sightings, we have chosen a different path: in-depth, hands-on investigations. The result, we hope, is thorough enough and scholarly enough for avid lake monster researchers and entertaining enough for mystery lovers and armchair cryptozoologists alike. Readers will also get a taste of what it's like to work alongside us as we plunge into the depths of these mysteries firsthand — with the exception of Loch Ness. Although the Loch Ness monster is the world's most famous, in some ways, that makes it less interesting from an investigative standpoint. The loch has been continually and meticulously searched, and although we hope to investigate it ourselves someday, there was little new that we could bring to the mystery for now. For a careful and critical examination, see Ronald Binns's book *The Loch Ness Mystery Solved*

Anyone who has followed the nearly century-long modern interest in Nessies recognizes as sheer ignorance a claim that the Loch has been "continually and meticulously searched"; there have been many searches, but many time-spans and many locations have not been examined, most pertinently the deepest basins.

Sonar Echoes

Disbelievers need to explain away *frequent* sonar

echoes, to the present day[10], from apparently large, often moving targets, with a few reports of tracking a moving target (Bauer, 2002; Mackal, 1976, pp. 123-132, 295-308).

Binns (1983, pp. 146-155) emphasized the inconclusive results of two expeditions by Cambridge students. He asks why other fishing trawlers passing through the Loch did not observe a Nessie since, in 1954, a trawler had apparently done so — a rhetorical question absurd on its face. The significant results obtained by electrical engineers from Birmingham University are denigrated because more were not obtained, which is rather absurd again. The underwater photos with simultaneous sonar echoes obtained by the Robert Rines teams are denigrated by innuendo, as are the other side-scan sonar echoes.

Shine (2006) argued that all sonar echoes result from such artifacts as reflections from loch walls or from thermoclines or seiches or other wave effects. He discounts even the strong echoes from apparently large, rapidly moving objects that Shine's own team published in 1983 and which, according to Loch Ness Project insider Harmsworth (1985), were most likely not artifacts. Shine admits: "It is still true that most sonar expeditions have reported echoes they do not understand, as we have", including the three strong contacts from non-stationary objects made during Operation Deepscan (Bauer, 1987).

Eyewitness Reports

The evidence of eyewitnesses tends to be very *subjectively* compelling, particularly when it comes from well-known people, but it is, *objectively* speaking, the weakest evidence. Here, we describe how the determined would-be debunkers of Loch Ness Monsters are obsessed with discrediting eyewitness reports, at times resorting to *ad hominem* allegations and other irrelevancies. The following examples also illustrate various logical fallacies that obfuscate the weakness of an argument. This is a perennial tactic exemplified in the story of the preacher's sermon notes: *Argument weak here — thump pulpit*!

The first example is, appropriately enough, the eyewitness testimony, which in 1933 set in motion the continuing modern-day phenomenon of the Loch Ness Monster. Local correspondent Alex Campbell wrote in the local newspaper[23], headlined "*Strange Spectacle on Loch Ness*":

> Loch Ness has for generations been credited with being the home of a fearsome-looking monster, but, somehow or other, the "water kelpie", as this legendary creature is called, has always been regarded as a myth, if not a joke. Now, however, comes the news that the beast has been seen once more, for on Friday of last week, a well-known businessman who lives in Inverness, and his wife (a university graduate) when motoring along the north shore of the loch, not far from Abriachan pier, were startled to see a tremendous upheaval on the loch, which, previously, had been as calm as the proverbial millpond. The lady was the first to notice the disturbance, which occurred fully three-quarters of a mile from the shore, and it was her sudden cries to stop that drew her husband's attention to the water. There, the creature disported itself, rolling and plunging for fully a minute, its body resembling that of a whale and the water cascading and churning like a simmering cauldron. Soon, however, it disappeared in a boiling mass of foam. Both onlookers confessed that there was something uncanny about the whole thing, for they realized that here was no ordinary denizen of the depths because, apart from its enormous size, the beast, in taking the final plunge, sent out waves that were big enough to have been caused by passing steamer. (p. 5)

The couple were later interviewed, in November 1933, by Rupert Gould (1934, pp. 39-40), who refers to the object in view as "*X*":

> Mrs. Mackay and her husband were driving from Inverness to Drumnadrochit. At a point on the road almost opposite Aldourie Pier [which is on the other side of the Loch], Mrs. Mackay caught sight of a violent commotion in the water nearby, about 100 yards from shore. She thought at first that it was caused by two ducks fighting, but on reflection, it seemed far too extensive to be caused in this way. The commotion subsided, and a big wake became visible, apparently caused by something large moving along just below the surface. This wake went away across the Loch towards Aldourie Pier. Then, about the middle of the Loch [some 450 yards from her], the cause of the wake emerged, showing two black humps moving in line - the rear one somewhat the larger. The rear hump appeared first, and Mrs. Mackay took it for a whale on account of its blue-black color [she has often seen whales at sea]. The two humps moved with the forward-rolling motion of a whale or porpoise but always remained smooth in outline, exhibiting no traces of fins. They rose and sank in an undulating manner [as if sliding along a submerged switchback] but never went entirely out of sight. Mrs. Mackay estimated the overall length of the two humps at about 20 feet.

> X, after rising, continued to move towards the pier for some distance. Then it turned sharply to port and, after describing a half-circle, sank suddenly with considerable commotion.
>
> [Mr. Mackay, who was driving the car, only stopped in time to see the final commotion and a noticeable "wash" which came rolling onto the shore after X had sunk.]

As the earliest primary sources for this claimed encounter, they should be used in any critical attempt to assess what was observed. One clear logical fallacy is the attempt to debunk this account by researcher Dick Raynor, who said concerning the first quoted version above[24]:

> Despite everything else, the phrase "Loch Ness monster" does not appear in this article — for this, we have to wait until 9th June 1933. As for seals "not being definitely proved in Loch Ness", we have references to them at Fort Augustus three decades earlier, and today it is not unusual to see them in Loch Ness. His successors in office slaughter them routinely. Had Campbell known that, he might have recognized a typical seal mating display in the detail of the Mackay's account. (http://www.lochnessinvestigation.com/history.html)

Onus probandi fallacy. Raynor is right; seals can make their way into the loch, probably chasing fish; however, this is infrequent, two present simultaneously is quite rare, and they are usually shot within a short time:

"A Common or Harbour Seal *Phoca vitulina* L. lived in Loch Ness, Scotland, for seven months from November 1984-June 1985[25]. . . . This is the first time a seal has been proven in Loch Ness. Fishermen's reports indicate that Loch Ness is visited by a seal approximately once every two years. . . . Two seals together were seen on two occasions. The number of seals reported by individual fishermen varied greatly: one man had seen six seals during the period, some men have never seen a seal yet" (Williamson, 1988).

Raynor's proposed theory of two seals mating may seem like a real possibility to a lay audience, but it has no evidentiary basis. It fails the logical fallacy of *Onus Probandi* or *Burden of Proof*: that seals may seem more probable than large, unknown animals does not absolve the need for some basis in actual evidence.

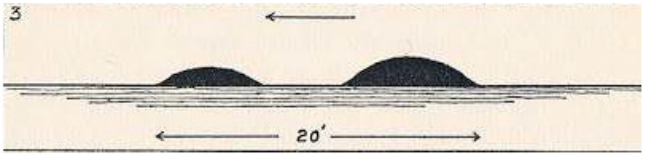

Figure 6. Gould Sketch of Mackay Sighting (Gould,1934).

Secundum quid fallacy. Another fallacy is that of *Omission*, where part of the testimony is discounted since it would defeat the proposed explanation. In this case, the sketch below drawn up by Gould with the aid of Mrs. Mackay shows two humps each about six to seven feet long. Seals normally only show about two feet of their back on the surface. This conflict is "resolved" by invoking the sub-category of imperfect human observation, and that length is harder to estimate than color or shape. In relative terms, that is true, but invariably, it is implied in such analyses that it is a parameter that cannot be estimated and can, therefore, be ignored despite being one of the most important parameters in this debate.

Ad rudiculum fallacy. Allied to this is the logical fallacy of *Appeal to Ridicule*, which is exemplified here in the discounting of eyewitness observational skills on grounds of assumed incompetence. However, some eyewitnesses may be quite good at assessing objects on the loch fairly accurately, owing to their observing of the Loch in its various moods, and its inhabitant creatures, over years or decades: anglers, water bailiffs, tourist-boat operators. No account is taken of this by the disbelievers ; everyone is brought down to the same level on the *a priori* assumption that there is no Loch Ness Monster: if you claim to see monsters, you must be an unreliable observer worthy of ridicule.

Since the Mackay case is a seminal account in the history of the phenomenon, it is especially targeted by debunkers: if you can debunk the initial mistake, what followed is already tainted. It is, therefore, no surprise that other critics have also taken up this case, though offering different explanations. Thus Steuart Campbell (2013) commented in *The Scotsman*:

> I conclude that the Mackays saw Scot II's wakes interacting as they collided with the shores of the narrower north-east end of Loch Ness and that the only monster in the lake at the time was Scot II. (https://www.scotsman.com/news/opinion/columnists/steuart-campbell-say-goodbye-to-loch-ness-mystery-1579700)

Scott II was a ferry boat with an ice-breaker hull which produced larger bow-waves than normal, and therefore bigger standing waves when conditions allowed. In fact, Scott II seems to have been a favorite attempted explanation by disbelievers of a number of sightings, during the boat's service life-time. However, this explanation also

fails the burden of proof in not being properly tested. The assertion that standing waves are reinforced by reflection from the shore back into the loch is debatable, according to Dick Raynor[26]:

> I often read about the divergent waves bouncing off the steep shores and being reflected back into the center of the loch to produce standing waves, but I have never seen that myself; I just see the waves break on the shore, and the energy is dissipated.[26]

The standing-wave argument also suffers from *Appeal to Ridicule* and *Omission* in that standing waves do not change direction as in the manner reported by Mrs. Mackay. That inconvenient statement is omitted, and once again, Aldie Mackay's observations are discounted on the grounds of presumed observational incompetence.

Last but not least, in this case, we come to Ronald Binns, who wrote about this sighting in his first book (Binns, 1983). Here, the logical fallacies take a different route.

Ad hominem fallacy. In his analysis, Binns does not just take aim at the message; his aim is to shoot the messenger. Binns unhesitatingly states things he cannot know, that Alex Campbell, who wrote the account for the *Inverness Courier*, "wildly exaggerated" because Campbell was "deeply committed to the belief that Loch Ness was the home of monsters" and wanted to promote it, by fair means or foul. Binns further employs hyperbolic language to further the *ad hominem* by referring to the *Courier* article as a "cumbersome and stilted piece of prose" and to Campbell as "the self-appointed high priest of the loch's mysteries" with "a great zest for publicity," thus an unreliable journalist, in order to undermine the Mackays' testimony.

No doubt Alex Campbell was an important figure in the story of Loch Ness, but that he was all too happy to be interviewed by the media is hardly proof of a large ego needing attention or fabricating newspaper articles.

The claims of exaggeration are shown to be unfounded by comparison with the Gould version. Binns minimally refers to this important corroboration as another recounting of the Mackay story "months later" and uses this to pick out two minor discrepancies in Campbell's account. One was that Mr. Mackay actually saw nothing and that Mrs. Mackay had only seen a "commotion in the water" akin to "two ducks fighting." That is all he says, and this is the weak basis for the accusation of wild exaggeration. Aldie Mackay had indeed initially thought the commotion was ducks but had then dismissed this notion quite promptly.

These four attempted explanations by three debunkers are all rendered in assured tones, yet it is quite obvious that at least three of the possibilities must be wrong, and possibly all of them: Was it mating seals? *Or* boat wakes? *Or* fighting ducks? *Or* journalistic fabrication? Only in popular debunking would four quite different explanations apparently be deemed acceptable as proving something.

CHANGING THE DATA TO FIT THE THEORY

The last example of fallacious reasoning has to do with the Spicer land-sighting of 1933. This was what effectively promoted the Loch Ness Monster mystery from a local to a national and international *cause célêbre*, beginning with George Spicer's (1933) letter to a local newspaper, referring to events thirteen days before:

> *Dear Sir,*
>
> *I have just returned from a motoring holiday in Scotland and am writing to inform you that on Saturday afternoon, 22nd July last, whilst traveling along the east side of Loch Ness between Dores and Foyers Hotel, about halfway, in fact, I saw the nearest approach to a dragon or pre-historic animal that I have ever seen in my life. It crossed my road about fifty yards ahead and appeared to be carrying a small lamb or animal of some kind.*
>
> *It seemed to have a long neck, which moved up and down in the manner of a scenic railway, and the body was fairly big, with a high back: but if there were any feet they must have been of the web kind, and as for a tail I cannot say, as it moved so rapidly, and when we got to the spot it had probably disappeared into the loch. Length from six feet to eight feet and very ugly.*
>
> *I am wondering if you can give me any information about it, and am enclosing a stamped addressed envelope, anticipating your kind reply. Whatever it is, and it may be a land and water animal, I think it should be destroyed, as I am not sure whether had I been quite close to it I should have cared to have tackled it. It is difficult to give a better description, as it moved so swiftly, and the whole thing was so sudden. There is no doubt that it exists.*
>
> *Yours etc,*
>
> *G. SPICER*

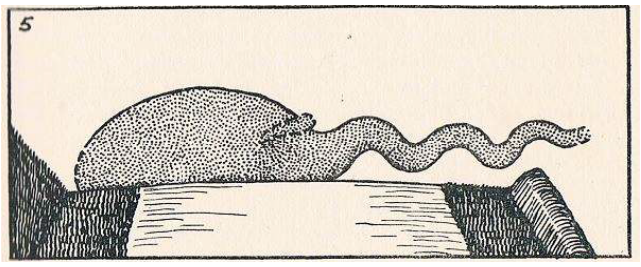

Figure 7. Gould Sketch of Spicer Sighting (Gould, 1934).

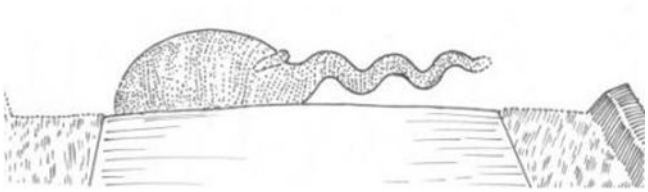

Figure 8. Lovcanski Reimagining of Gould Sketch (Lovcanski, 2010).

A meeting later in the year with the aforementioned researcher, Rupert T. Gould, led to the sketch below being published in his book (Gould, 1934, p. 43). The idea that such a creature could take to land has even led a few Nessie believers to challenge the account. But whether it is true or not does not excuse fallacious reasoning.

Once again, debunkers offer various theories, as though this were all that is needed to discredit the claimed event: a line of otters, a huddle of deer, *or* plain fabrication.

Alexander Lovcanski (2010) proposed a combination of otter and mirage effect on the hot road, causing an optical illusion, a light refraction owing to a temperature inversion that magnified the size of the animal. One could raise questions about the probability of the Spicers encountering an otter crossing the road through a heat haze, plus the question as to whether the nature of the road at that time could re-radiate sufficient heat. But Lovcanski argued that by wanting to change the data, the length of the creature should be shrunk to fill only the road and not the grass verges in the original sketch. He creates a new sketch, shown above.

The original account gave the length as from six to eight feet, but when George Spicer found out the exact width of the road, he felt compelled to revise the length to at least 25 feet (Gould, 1934, p. 46). There is no reason to doubt the accuracy of the original sketch, since Gould and the Spicers discussed the event and created the sketch together. George Spicer, as a direct witness, made this correction to the data, but has a debunker the same, right? The reason for the change was not to stay true to the original data but because the mirage theory would fall apart if it was actually a 25-foot creature. Lovcanski interprets the undulating neck as a distorting effect of the mirage on the otter's tail. However, Gould's sketch has that neck largely over the grass verge and beyond. The mirage can only be in effect over the hot surface of the road. It would not appear over the cooler grass and hence would invalidate Lovcanski's theory.

So, the entire undulating neck is squashed into the hot zone where a maximum illusion could take effect: the data are changed to fit the theory.

Figure 9. MacNab 1 (Mackal, R. ,1976. "The Monsters of Loch Ness", p. 274).

This approach is far from unique in Nessie debunking. It is seen across the board as key statements by eyewitnesses are altered from the actual original testimony. The most common tactic is to identify the object as a smaller animal, such as a bird, otter, or wave formation, on the grounds that such statements are the product of misperception involving the estimated size of the object. Shrink the object, and it begins to fit other known objects.

So, too, in the treatment of photographs. Consider the one taken by Peter MacNab on the 29th of July 1955, as described by him to author Nicholas Witchell (1974, p. 126):

> I was returning from a holiday in the north with my son and pulled the car up on the road just above Urquhart Castle. It was a calm, warm, hazy afternoon. I was all ready to take a shot of Urquhart Castle when my attention was held by a movement in the calm water over to the left. Naturally, I thought of the 'Monster' and hurriedly changed over the standard lens of my Exacta (127) camera to a six-inch telephoto.
>
> As I was doing so a quick glance showed that some black or dark enormous water creature was cruising on the surface. Without a tripod and in a great hurry I took the shot. I also took a very quick shot with another camera, a fixed-focus Kodak, before the creature submerged. My son was busy under the bonnet of the car at the time and when he looked in response to my shouts there were just ripples on the water. Several cars and a bus stopped but they could see nothing and listened to my description with patent disbelief.

The photograph was published in 1958, a week af-

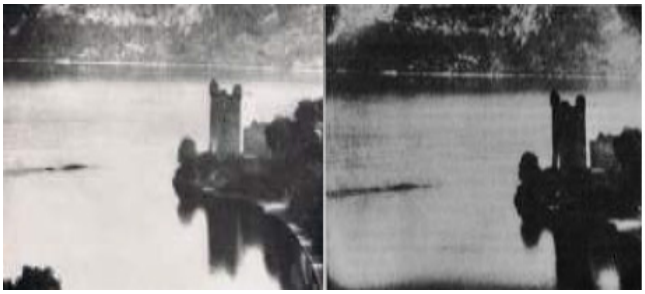

Figure 10. MacNab 2 (Mackal, R. ,1976. "The Monsters of Loch Ness", p. 274).

ter the same newspaper had published another picture allegedly of the monster. MacNab said he had taken his own picture three years before, but had withheld it for fear of ridicule. The publication of the other picture had seemingly emboldened him.

Skeptical interpretations have uniformly stated the object to be a form of boat wake, generated by one or more boats. Burton (1969) described it as the stern wave of a boat which had since disappeared out of camera view. Binns (1983, p. 101) modified this theory to make it a combination of three trawler-wakes constructively interfering to produce a more pronounced wave. However, he is not entirely convinced by his own theory, as the pronounced height of his proposed wave still looks unusually high. This has led others to suggest further that the humps in the image are actually painted onto boat wakes in the original picture and re-photographed. At this point, various commentators defer to the analysis of Roy Mackal, who claimed to have found problems with the photograph that render it inadmissible as evidence:

Ignoratio Elenchi Fallacy

Mackal (1976, pp. 103, 273-276) compared a print of the MacNab image from earlier publications against one he personally obtained from MacNab. The image to the left in Figure 10 is from Whyte (1961), and the one on the right is what Mackal received from MacNab sometime before 1976. Mackal points out two discrepancies in his analysis. The first involves the presence of the foreground bush in the 1961 image, which is absent in his own copy.

Now, in terms of the way the later image was produced, there is no real argument. It is an enlargement taken from a negative either by the popular methods of contact printing or the use of an enlarger. The first involves placing the negative in intimate contact with photo-sensitive paper, and the second by projecting the image of the negative onto a screen holding the same type of paper. The latter method offers more opportunity to crop a projected image, depending on where the paper is placed under the beam. By performing an overlay of the two prints in question, one can see how the foreground

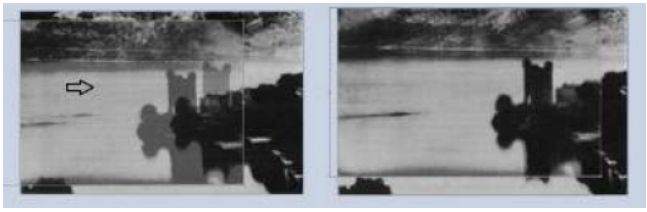

Figure 11. MacNab 3 (Watson, R.; Online. https://lochnessmystery.blogspot.com/2012/02/analysis-of-peter-macnab-photograph.html)

bush would be lost in the enlargement process. A series of simple measurements show that about 17% of the image has been cropped out at the bottom, left, and right.

The problem is not the enlargement but that, according to Mackal, MacNab could not give him an adequate explanation for why the two pictures were different. As a consequence, Mackal adds a needless layer of complexity in suggesting that the 1961 and 1976 prints "evolved" from an earlier original print. That inevitably allows the speculation that this theoretical original print may have had no monster on it at all.

A second objection concerns the 1976 print and its slightly squinted image of the castle and its reflection on the waters below. Mackal estimates that the tower skews to the left by about 4 degrees compared to the 1961 picture, and the reflection in the water skews a similar amount to the right. Mackal again suggests a reasonable explanation for this: the enlarging process used a camera mounted above the photo-sensitive paper with the camera slightly off-angle to the perpendicular.

An alternative possibility is that the original negative was not properly stored against the effects of humidity and sunlight in the twenty years since it was taken, and some degree of warping had occurred.

Ultimately, the picture is called into question for discrepancies that have adequate possible photographic explanations. Why MacNab could not simply tell Mackal that it was an enlargement is baffling, and there is no way now to get a definitive answer. The simplest explanation is that MacNab saw no issue with cropping out unimportant parts of the picture; several reproductions of it have cropped even more, without comment. The main point is that there is no evidence of deception on MacNab's part, nor any motive for such deception.

DEBUNKING ARGUMENTS NOT DIRECTED AT SPECIFIC EVIDENCE

Some commonly made arguments are quite non-specific, unfalsifiable, and carrying no weight.

No Such Creatures are Known to Science

'Not known to science' really stands for 'cannot

imagine such creatures existing', and there are certainly grounds for mystification:

- If they are air-breathers, as all guesses about them conclude, why are they seen so rarely at the surface?
- If they are not air-breathers, why do they ever come to the surface?
- What about the claimed sightings on land? (Watson, 2018).

Questions awaiting answers do not constitute evidence against, however, let alone proof. Asserting that science's contemporary inability to offer plausible candidates proves non-existence entails utter belief in contemporary scientific knowledge as final and complete, an attitude known as *scientism*, having religious-type faith in science. That does not comport with the fact that science is an empirical, fallible, human activity.

In any case, it surely remains possible to discover new species, even of large size or long thought extinct. Nessie fans cite the coelacanth, discovered in 1938, and the megamouth shark, discovered in 1976. Both are deep-dwelling aquatic animals.

Systematic Surveillance has not Produced Convincing Photos or Films

Surface sightings are rare; as Adrian Shine once commented, waiting for a surfacing is a war of attrition against the laws of chance. This merely confirms the belief that Nessies are habitually deep-dwelling.

No Carcass of a Nessie has Ever Been Found

The implication is that carcasses *should* turn up if Nessies are real, but there is no warrant for such an assertion[27]. Deep-dwelling creatures will deposit their carcasses in the depths, where they will likely be used as food by fish or by their cannibalistic kin. Eels are abundant at the depths of Loch Ness; in 1966, for example, Hungary imported 2,500,000 fry and 800,000 young eels from Loch Ness[28].

There is Not Enough Food for a Herd of Large Predators

Comprehensive data yield an estimated 169-186 tons of aquatic bio-mass, "enough food . . . to viably sustain a number of large and unknown creatures"[28].

Traditional Folklore and Legends about Kelpies, Water Horses, and the Like Have Caused Observers to Interpret Natural Phenomena as Stemming from Nessies

Such folklore concerns bodies of water in general, so one would expect Nessie-type reports from Scottish lochs in general. However, it turns out that water horses are much more frequently mentioned in connection with Loch Ness than with other lochs (Watson, 2011).

Furthermore, if Nessies are real, surely they are large and remarkable enough to be featured in local folklore. Several disbelievers have suggested that people imagined seeing a Nessie because of the influence of the monster movie, *King Kong* ("one of the biggest pop-cultural events of 1933", Naish, 2017, p. 84).

Photos are Either Hoaxes or Misleading in Some Way

That many photos may be misleading, and that many hoaxes have been perpetrated, is actually irrelevant to the issue of whether Nessies are real.

THE MOST PROMINENT CONTEMPORARY AND RECENT DEBUNKING

Probably the best-known and influential source of assertions that Nessies are definitely not real is Adrian Shine's Loch Ness Project. It is based in the Drumnadrochit Hotel, in a commanding position on the main (western) road along Loch Ness, the A82, with signs prominently declaring it to be the Loch Ness Centre and Exhibition; a pond next to the main building features a floating model of Nessie. The Exhibition was founded by Harmsworth in 1979, and Shine himself has been there since the early 1980's. This longevity, together with the prominent location, makes Shine the obvious go-to person in the eyes of the media; he is featured in many TV documentaries and is often cited in news items.

Shine's monster-related doings began in the early 1970's when he participated in the search for Morag, Nessie's cousin in Loch Morar. Shine's courageous and determined efforts there included long submersions in a self-built spherical observation chamber. He called his efforts the Loch Morar Project. Frustrated over the lack of results, he moved his base of operations to Loch Ness as the Loch Ness and Morar Project, and in the later 1980s, the reference to Morar was dropped.

The original Harmsworth Exhibition had emphasized the evidence that Nessies are real, though Harmsworth (1985) admitted that his personal belief fell short of proof. Shine eventually took over the Exhibition and slowly changed its emphasis to a study of Loch Ness itself, ascribing all monster reports and assertions to misperceptions of natural phenomena, including such creatures as seals or sturgeon. Shine's present opinions and the nature of the exhibition are a naturalistic debunking, set out

in the booklet *Loch Ness* (Shine, 2006).

Binns has reiterated the points made by disbelievers in his 1983 book in two more recent volumes, 2017 and 2019. Here are short reviews of these works:

Adrian Shine (2006): *Loch Ness*

This little booklet of 30 pages is really a description of the Loch Ness Exhibition. Fewer than half of the pages even mention 'monster', and then invariably in a negative way. Although the marine clam shell found by Rines and shared with the Loch Ness Project is mentioned (p. 5), its carbon-dated age is not; yet that date contradicts Shine's assertion (2006, p. 2) that the ocean did not flood the Loch after the last Ice Age.

There is a courteous acknowledgment of the sincerity of eyewitnesses, together with dismissing the possibility that any of the reported sightings are of an unidentified animal. Even so, the pamphlet says, "Yet elements of the sighting record were and still are, very compelling; particularly close encounters before the sensation of 1933" (Shine, 2006, p. 25). Charts are reproduced of the three deep-water contacts made during Operation Deepscan and attributed to artifacts, despite the acknowledgment that "most sonar expeditions have reported echoes they do not understand" (Shine, 2006, p. 24).

Ronald Binns (1983): *The Loch Ness Mystery Solved*

As detailed earlier, Binns' argument that the Dinsdale hump was a boat simply does not hold water, so to speak; and his critique of the frequent sonar-contacts is similarly ineffective (he might not yet have known of the striking results published by the Loch Ness & Morar Project in 1983). Only 25 of the book's 220 pages deal with the strongest objective evidence for Nessies: sonar and the Dinsdale film. The rest of the book is replete with factual errors, misleading statements, innuendo, and *ad hominem* slurs about Dinsdale and many others. Binns asserts much that he could not know: Dinsdale "tossing endlessly in his sleep" (p. 107), "in a state of considerable fatigue . . . in such a condition of stress and nervous excitement" (p. 109), "deeply excited . . . on the brink of nervous exhaustion . . . [yet] overwhelmed with excitement" (p. 110), "Filled with new hope . . . Shaking with excitement" (p. 111), "excitedly drove" (p. 112).

A full and negative dissection of Binns' book has been published by Bauer (1985). Shine (1985) remarked on some of the same flaws in the book. Watson published on amazon.com[29] a lengthy critique of Binns' maligning of Alex Campbell.

Ronald Binns (2017): *The Loch Ness Mystery Reloaded*

This book adds nothing new to what Binns wrote in 1983, as he himself admits: "not so much a sequel . . . as an appendix" (p. vi). It has the flaws of the earlier book: innuendo, *ad hominem* slurs, reiteration of trivialities, but no convincing criticism of the objective evidence of film and sonar. Indeed, repeated (p. 13) is the absurdity that "The case for the Loch Ness monster rests overwhelmingly on eye-witness evidence."

Binns makes extraordinary claims for the 1983 book: "how influential it was, ""pioneering analysis," "stood the test of time" (p. 7); "full of gentle wit . . . iconoclastic" (p. 10); "it exploded beneath the complacent certainties of Loch Ness Monster orthodoxy with all the force of a small nuclear detonation" (p. 14).

The 1983 volume did have a bibliography and index, and its assertions were sourced in footnotes. The 2017 book has no index or bibliography, and the end notes are entirely inadequate; thus, without any documentation, Binns charges that "as more and more of the classic evidence collapsed even Witchell eventually performed a spectacular and astonishing somersault, though he did so in silence, without a word of explanation" (pp. 8 and 14). Rines's Academy of Applied Science was "made up of businessmen, not scientists" (p. 11). *Wrong*: Rines's teams included Harold Edgerton, inventor of strobe photography and recipient of USA's Medal of Freedom, as well as Kodak's photographic expert Charles Wyckoff and sonar designer and manufacturer Marty Klein.

There is no point in detailing all the false statements, undocumented speculations, and derogatory references to many people; there is nothing of substance in this "appendix" to the 1983 book. An example of Binns's arrogant hubris is when he criticizes Williams (2016) for "a very inadequate index" (p. 151) in a Binns book *that has no index at all*.

Ronald Binns (2019): *Decline and Fall of the Loch Ness Monster: Contested Histories and Revisionist Tales*

This book has the same unappealing features as the 1983 and 2017 volumes, including the lack of an index; and as also in the 1983 book, Binns makes statements that are simply wrong, for example, "There is not even a bibliography of writings about the Monster" (p. 11). What about Bauer (1980, 1982)? And Bauer (1986, pp. 201-233) which lists books, articles, newspaper reports as well as sighting reports and their provenance (Bauer, 1986, pp. 169-200)?

Nicholas Witchell was alleged in Binns (2017) to have become a non-believer, a charge of "apostasy" repeated

here (p. 11); yet Witchell is also, later in the book, called "congenitally incapable of engaging with the skeptical case against Nessie" (p. 222). A similarly recent *Time* story (Greenspan, 2019) still cites Witchell's book without warning readers of any change of belief on the part of the author.

Also reiterated is the ludicrous claim that the hump's wake is just like that of a boat: "The screw wake the object leaves is perfectly visible to anyone whose interpretive skills are not warped by a desire to see a monster" (p. 204). We leave it to the reader to look at the film[7] and judge that assertion.

A whole chapter is devoted to criticizing Bauer for various misdeeds, for instance: "It took Henry Bauer two years and one month to publish a review of *The Loch Ness Mystery Solved*" (p. 202).

My book (Bauer, 1986) is said (p. 207) to exclude "the arguments of both sceptics and the 'wrong' kind of believers," yet the first two chapters are, respectively, "The monster is a myth," presenting the evidence interpreted as against the reality of Nessies, and "The monster exists," showing how the very same evidence can be interpreted as favoring the existence of Nessies.

"Lester Smith" (D. G. Gerahty), whom I cited for claiming to have invented Nessie, is described as a "minor novelist," yet he was a best-selling author of several dozen works in mid-20th-century English-speaking countries, under the pen-names of Stephen Lister and Robert Standish. As in the 1983 and 2017 books, Binns knows what people were feeling and thinking; for example, what "surely earned him Bauer's wrath" (p. 207).

Gareth Williams (2016) is criticized for saying that the 1987 symposium organized at the Edinburgh Museum of Natural History brought skeptics and believers together, but that is indeed what happened since the attendees included the skeptical Shine as well as Dinsdale and other believers: Henry Bauer, Richard Fitter, Paul LeBlond, Roy Mackal, and Robert Rines.

Binns denigrated the symposium since it was co-sponsored by the 'so-called' International Society of Cryptozoology; at the same time, he complains about not being invited to participate. Biologist Mackal's credentials are queried as "irrelevant to the identification of a hypothetical lake monster" (p. 213). Shine and Martin are held to task for calling Bauer's book "perceptive" and "describing well" the difference between science and fringe studies (p. 217).

Yet again, Binns fails to engage convincingly with the objective evidence of films and sonar. The book concentrates on the easy targets of eyewitnesses and photos, as well as second- and third-level nitpicking and *ad hominem* slurs at all and sundry. How shamelessly Binns mischaracterizes what others have written is encapsulated by the following: "Concentrating exclusively on the case against the monster, *Arthur C. Clarke's Chronicles of the Strange and Mysterious* reiterated key arguments by myself and Steuart Campbell and concluded: 'While there is a chance, however faint, that such a creature may exist, the search is sure to go on'" (pp. 220-221). In actual fact, that book (Welfare & Fairley, 1980, pp. 108-115) lays out the positive evidence including the Dinsdale film and the underwater photographs and sums it all up anything but negatively: "If you want my personal opinion — on Mondays, Wednesdays and Fridays I believe in Nessie. . . .". It would also have been rather miraculous for this 1980 volume to reiterate "key arguments" — or anything else — from a 1983 book by Binns or a 1986 book by Campbell.

DEBUNKING STRATEGIES, TACTICS, AND MOTIVATIONS

The earlier detailed deconstruction of the Nessie-debunking arguments reveals certain overall strategies and tactics. It illustrates what is often pointed out, that disproving lies or innuendo or illogicalities requires more effort and more words than it took to perpetrate the lies, innuendos, and illogicalities. Having given 'chapter and verse', we can now summarize.

The main strategy that debunkers share is that of subtle misdirection, the strategy used by stage magicians: diverting the audience's attention to something other than what the magician actually does. One common technique of misdirection is to concentrate at great length on the weakest evidence, as detailed above: the variations, inconsistencies, and changes of stories over time of eyewitness reports; still photographs, some of them fakes; much relating of hoaxes, and generalities about human psychology and myths and legends.

A second equally common method is to argue that because the topic is not within mainstream science, it is pseudo-science, and therefore, it is wrong. Because 'science' has such prestige and status, many people fail to notice that "not science" is not the same as 'not true', and pundits encourage that illusion: "Scientific consensus is the gold standard for rational belief" McIntyre (2021, p. 137), reflecting a belief in the ideology of scientism, that science and only science certifies truth. These critics often self-label as 'Skeptics'[30], but since they specialize in debunking and are not at all skeptical about mainstream science, the contemporary 'scientific consensus', these self-labeled Skeptics are actually *pseudo*-skeptics (Truzzi, 1987).

Arguing under the banner of 'Skeptic', and under the ideology of scientism, again illustrates the strategy of

misdirection: discussing at great length, how to distinguish science from not-science, philosophy's 'demarcation problem', draws attention away from all that really matters: the actual specific evidence.

Some of the most determined arguers that Nessies definitely do not exist are, as earlier noted, erstwhile believers: Binns, Shine, Richard Carter, and Dick Raynor. Steuart Campbell might also be included in this group in a more general way since he had been positively interested in such anomalies as UFOs before taking up science[31]. That true believers who lose faith become dogmatic non-believers rather than open-minded genuine skeptics is quite a general phenomenon, illustrated in politics by those who lost Communist faith and became the most vigorous anti-Communists, say Arthur Koestler or Whittaker Chambers.

The same strategies and tactics are employed by those who include Nessie-seeking as they disparage all 'pseudo-science', for example, Loxton and Prothero (2012) and Radford and Nickell (2006). Historian Michael Gordin (2021), too, used Nessie as an example in asserting riskiness in believing in 'fringe science'.

Those interested in or speaking for the reality of Nessies do not claim *final proof*; only that sufficient evidence exists to warrant serious research. Debunkers, on the other hand, not only argue by misdirection, but they also commit the irrationality of trying to prove *beyond any doubt* that *a certain thing does not exist* or *a certain thing never happened and never could happen*. Those who try to prove such a negative ought to be reminded that 'absence of evidence is not evidence of absence'.

ENDNOTES

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3 For example, Douglas Charles, "Scientists now say existence of Loch Ness Monster is 'plausible' after unexpected fossil discovery," 27 July 2022; https://brobible.com/culture/article/scientists-loch-ness-monster-plausible-fossil

4 Jack Butler, "Against Loch Ness Monster clickbait", 28 July; https://www.nationalreview.com/corner/against-loch-ness-monster-clickbait

5 For details of those many possibilities, see the Appendix in Bauer (2022).

6 Houran, J. & Bauer, H. H. (2022). 'Fringe science' — A tautology, not pariah. *Journal of Scientific Exploration*, 36, 207-217; Bauer, H. H. (2014). Shamans of scientism: Conjuring certainty where there is none. *Journal of Scientific Exploration*, 28, 491–504.

7 https://www.themanwhofilmednessie.com/tims-nessie-film.html

8 *Proceedings of the Linnean Society*, Pt. 1, 8 November 1934, pp. 7-12.

9 http://www.nessie.co.uk/htm/the_evidence/cine1.html#26; https://www.youtube.com/watch?v=aFKlnhGvhfc;http://lochnessmystery.blogspot.com/2015_05_31_archive.html

10 http://lochnessmystery.blogspot.com/search?q=sonar

11 https://worldcams.tv/united-kingdom/inverness/loch-ness

12 https://lochnessmystery.blogspot.com/2019/10/looking-back-on-edna-results.html

13 Personal communication from Gemmell to Bauer, 29 September 2019.

14 http://lochnessmystery.blogspot.com/2012/11/the-marks-of-honesty-and-deceit.html

15 http://lochnessmystery.blogspot.com/2011/08/classic-sightings.html; http://lochnessmystery.blogspot.com/2019/11/rain-mud-and-adrian-shine_16.html; http://lochnessmystery.blogspot.com/2013/09/logs-and-nessie.html

16 http://lochnessmystery.blogspot.com

17 https://www.lochness.co.uk/fan_club

18 http://www.lochnessinvestigation.com/

19 https://mega.nz/file/JX530AKC#FXp99K_F2IpVjy-6Q3Ijh3ukb_0jnThXBaKS35r0Xq8w
On a cryptozoology internet discussion forum, Shine once challenged Bauer to make available to him his copy of the Dinsdale film. In response, Bauer also detailed flaws in Shine's "Image Analysis" https://mega.nz/file/RfAH3AzT#AsCygT2fEQqUO9Oxk4vy7lMtcD9g4rg9s881APV6e9I

20 One of their failed attempts is shown in *Lake Monsters*, a Discovery Channel documentary produced by the BBC (Bauer, 2002).

21 https://henryhbauer.homestead.com/DinsdaleFilm.html

22 Bauer has published a full deconstruction of this critique: https://henryhbauer.homestead.com/_NessieChapter.pdf. Several very negative reviews of the book are on Amazon. com: https://www.amazon.com/Abominable-Science-Origins-Nessie-Cryptids/product-reviews/0231153201/ref=cm_cr_unknown?ie=UTF8&reviewerType=all_reviews&-filterByStar=one_star&pageNumber=1

23 *Inverness Courier*, 2 May 1933.

24 http://www.lochnessinvestigation.com/history.html

25 This is presumably the seal whose head I observed lifted out of the water near Temple Pier in Urquhart Bay

in May 1985.

[26] Dick Raynor; https://www.cryptozoology.com/forum/topic_view_thread.php?tid=5&pid=828745

[27] http://lochnessmystery.blogspot.com/2014/05/the-carcass-problem-part-2.html

[28] http://lochnessmystery.blogspot.com/2012/02/is-there-enough-food-for-nessie_12.html

[29] https://www.amazon.com/dp/0729101398#customerReviews

[30] Iconic of self-styled Skeptic is the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), founded in 1976 and since 2006 just CSI; website is now https://skepticalinquirer.org, the organization's journal.

[31] Personal communication to Henry Bauer, May 1985.

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